

HP 82184A

Plotter Module

Quick Reference Card

General Plotting Functions

CLIPUU Specifies plot bounds in user units, regardless of plotting mode. Interprets stack values as:

| | |
|---|------------------|
| T | <i>x-minimum</i> |
| Z | <i>x-maximum</i> |
| Y | <i>y-minimum</i> |
| X | <i>y-maximum</i> |

CSIZE Sets the character space height in GU's.

CSIZEO Sets the character space height in GU's (X-register), aspect ratio (Y-register), and slant—in current angular mode—(Z-register).

DGTIZE Enters the x- and y-coordinates of the pen's position into the X- and Y-registers when the plotter's ENTER key is pressed.

DRAW Draws a line from last pen position specified by plotter module to position specified by (x,y).

| | | |
|---|---|--------------------------------|
| Y | y | } Current Units (UU's or GU's) |
| X | x | |

FRAME Draws a box around the active plotting boundaries (graphic limits or plotting bounds).

GCLEAR Advances page on plotters that have a page feed mechanism.

IDRAW Draws a line from the last pen position specified by a plotter module function to a point x and y units from that position.

- IMOVE** Moves the pen from the position specified by the last plotter module function to a point x and y units from that position.
- LABEL** Prints the contents of the ALPHA register at the last pen position specified by the HP-41.
- LDIR** Sets the angle of rotation from 0° for printing labels. A positive value specifies counterclockwise rotation.
- LIMIT** Sets graphic limits in millimeters, according to values in stack. Interprets values in stack in same way as shown for **CLIPUU**. Also sets same default conditions as are set by **PINIT**.
- LOCATD** Specifies plotting bounds by digitizing the two opposite corners. When **ENTER POINT** is displayed, move pen to lower-left point and press plotter's ENTER key. When **ENTER POINT** reappears, move pen to upper-right point and press ENTER key again.
- LOCATE** Specifies plot bounds in graphic units, regardless of current plotting mode. Interprets values in stack in same way as shown for **CLIPUU**.
- LORG** Sets the label origin position (1 through 9).
- LTYPE** Uses a line type number (integer value 1 through 8) to select one of eight line types.
- LTYPEO** Operates same as **LTYPE** except that the number in the Y-register specifies the length of the repeat pattern as a percentage of the length of the diagonal between P1 and P2.
- LXAXIS** Draws x -axis between specified minimum and maximum x -values and at the specified y -intercept. Labels tic marks below the current plot bounds. A negative tic-spacing parameter specifies horizontal labels.

| | |
|---|--------------------|
| T | <i>x-maximum</i> |
| Z | <i>x-minimum</i> |
| Y | <i>tic spacing</i> |
| X | <i>y-intercept</i> |

LYAXIS

Draws y-axis between specified minimum and maximum y-values and at the specified x-intercept. Labels tic marks to the left of the current plot bounds. Labels are always printed horizontally.

| | |
|---|--------------------|
| T | <i>y-maximum</i> |
| Z | <i>y-minimum</i> |
| Y | <i>tic spacing</i> |
| X | <i>x-intercept</i> |

MOVE

Moves the pen to specified (x,y) coordinate without drawing a line. Interprets stack in same way as shown for **DRAW**.

PCLBUF

Clears I/O buffer created by **PINIT** and returns 26 memory registers to available program memory.

PDIR

Rotates the x- and y-axes to the angle specified in the X-register. Used only to rotate plot direction for incremental plotting (**IMOVE** , **IDRAW** , and **IPLOT**) and relative plotting (**RPLLOT**). Does not affect pen movement specified in absolute coordinates. **PDIR** angles are in reference to the original default **PDIR** angle (0°).

PEN

Selects pen specified by integer portion of a value in X-register.

PENDN

Lowers pen to plotting surface.

PENUP

Lifts pen from plotting surface.

PINIT

When I/O buffer does not exist, uses 26 memory registers to create it. Also performs the following:

- Sets plot bounds equal to graphic limits currently maintained by plotter.
- Sets UU's equal to GU's and sets to UU mode.
- Selects pen 1; sets line type 1.
- Sets 3 GU character space height.
- Sets label origin to 1 and label direction to 0°.

- Sets x- and y-axes tic lengths to default values for your plotter.
- Sets plotting rotation to 0° .
- If I/O buffer did not exist before executing **PINIT**, sets bar code plotting parameters to default values. Otherwise does not affect current bar code plotting parameters.

| | |
|---------------|--|
| PRCL | Recalls contents of the buffer register specified by a number in the X-register. |
| RATIO | Calculates for the current graphic limits the ratio of the x-axis length to the y-axis length. |
| SCALE | Sets user scale for plot bounds and sets plotter module to UU mode. Interprets values in stack in same way as shown for CLIPUU . |
| SETGU | Switches plotter module to Graphic Units (GU's) mode. |
| SETUU | Switches plotter module to User Units (UU's) mode. |
| TICLEN | Sets vertical and horizontal tic lengths to specified percentage of corresponding dimensions of graphic limits (GU's only). |
| UNCLIP | Resets the plot bounds to the graphic limits without changing the current user scale. |
| WHERE | Enters in the X- and Y-registers the corresponding coordinates (in current units) of the point specified by the last HP-41 pen movement function. Places current pen status in Z-register. |
| XAXIS | Draws a horizontal axis at the specified y-intercept (UU's or GU's). |
| XAXISO | Draws x-axis between the specified minimum and maximum x-values and at the specified y-intercept, with tic marks at specified intervals. Interprets parameters in current units and in same way as shown under LXAXIS . |
| YAXIS | Draws a vertical axis at the specified x-intercept for current plotting mode. |
| YAXISO | Draws a y-axis between minimum and maximum y-values at the specified x-intercept, with |

tic marks at specified intervals. Interprets parameters in current units and in same way as shown under **LXAXIS**.

Plot-Option Functions

The following four functions: (1) Use values in the X- and Y-registers to define next pen position—in current units (UU's or GU's); (2) move pen from the last position specified by a plotter module function to new position using existing pen status—"up" or "down"; (3) set pen status to "down" when pen reaches new point—except as provided by **PLREGX**.

- PLOT** Moves pen to or draws a line to the point specified by (x,y) coordinates.
- IPLOT** Same as **PLOT** except that x and y specify increments from last pen position specified by a plotter module function.
- RPLLOT** Same as **PLOT** except that x and y specify increments from the last pen position specified by a plotter module function *other than* **RPLLOT**.
- PLREGX** Moves pen or draws line to each point specified by the coordinates in the series of data storage registers R_{iii} through R_{fff} , as specified by the number *iii.fff* in the X-register. R_{iii} specifies x_0 ; R_{iii+1} specifies y_0 , and so on. If **PLREGX** finds an Alpha character in either data register of any pair included in R_{iii} through R_{fff} , the pen status is switched to "up". It remains so until a subsequent pair of data registers containing only numeric data is encountered.

Utility Plotting Program

- NEWPLOT** Prepares for plotting by prompting for six parameters, automatically assigning six default parameters, and transferring execution to **REPLLOT**. Uses R_{00} through R_{11} —which form the *plotting data base*.
- REPLLOT** Prompts you to either automatically generate a complete plot (by pressing **R/S**) or edit contents of any register *nn* (by pressing *nn* **R/S**).

- PLINIT** Initializes your plotter according to parameters in plotting data base.
- PLTUXY** Plots a function or data specified by parameters in plotting data base.
- PLANOT** Frames plotting area then annotates plot according to parameters in plotting data base.
- Y?** Prompts you to key in the next y-coordinate.
- X?** Prompts you to key in the next x-coordinate.

Utility Plotting Program User Parameters

| Storage | Parameter | Format |
|-----------------|-----------|-----------------------------------|
| R ₀₈ | NAME? | <i>label</i> or <i>bbb.eeet</i> |
| R ₀₀ | XMIN | <i>n</i> |
| R ₀₁ | XMAX | <i>n</i> |
| R ₀₅ | XINC | <i>-n, int</i> or <i>label</i> |
| R ₀₄ | YMIN | <i>n</i> |
| R ₀₇ | YMAX | <i>n</i> |
| R ₀₂ | PLTPRM | <i>ccclp.bbbt</i> or <i>label</i> |
| R ₀₃ | ANNOT | $\pm F_x XXxx.F_y YYyy$ |
| R ₀₆ | XAXAT | <i>n</i> |
| R ₀₉ | YAXAT | <i>n</i> |

Bar Code Functions

- BC** Uses bit pattern in ALPHA register to plot a single row of HP-41 bar code.
- BCA** Converts data in ALPHA register to an Alpha-replace bar code bit pattern. Places value in X-register to indicate number of bytes in bit pattern.
- BCAA** Operates in same way as **BCA** except that bit pattern is for Alpha-Append bar code.
- BCKSM** Computes checksum of bit pattern in ALPHA register and places checksum in byte specified by *bb* (in X-register), counting from the right. For HP-41 bar code:
- One-Byte Paper Keyboard: *bb* = 1
- Two-Byte Paper Keyboard: *bb* = 2
- Direct Execution: *bb* = no. of bytes in ALPHA + 1

BCO

Plotter Option. Operates the same as **BC** except that (1) HP-41 directional bars are not automatically added to row; (2) you specify how many rightmost bits to plot from first and last bytes; (3) enables you to interpret bit patterns in various ways, depending upon current bar code type. (Refer to **BCSIZE**.) Positive number in X-register specifies plotter option.

| | | |
|----------|-----------------------|--|
| Z | number of bits | (Leftmost Byte) |
| Y | number of bits | (Rightmost Byte) |
| X | bb | Bytes in Row (Includes Leading and Trailing Bytes) |

Printer Option. Prints on HP 82162A Thermal Printer a row of HP-41 bar code corresponding to bit pattern in ALPHA register. Negative number ($-bb$) in X-register specifies printer option; $|-bb|$ specifies number of bytes in row. To use after **BCA**, **BCAA**, **BCX**, or **BCXS**, just press **CHS** and execute **BCO**. To use after **BCP** press **RCL** **◻** **T** **CHS** **BCO**.

BCP

Uses program name in Y-register and row number/bit pattern ($rrr.bb$) in X-register to place in ALPHA register a bit pattern for specified program row. Negative $rrr.bb$ specifies "private" bar code. Places following values in stack:

| | | |
|----------|----------------|----------------------------|
| T | bb | Number of Bytes in Row |
| Z | fff.fff | Lines Coded in Row |
| Y | name | Program Name |
| X | ±rrr.bb | Next Row Number and Length |

BCREGX

Transforms the decimal values in a block of data registers into a bit pattern in ALPHA register. Each register corresponds to one byte. Uses $fff.fff$ in X-register to specify first and last data registers. R_{fff} corresponds to leftmost byte in bit pattern. Does not compute checksum.

BC

Uses absolute values of numbers in X- and Y-registers to adjust bar/space proportions (in APU's) and to specify bar code type (0 through 3).

Y: nn . t ww ss
 Narrow Bar Code Wide Space
 Bar Type Bar Width
 Width (0 = HP-41) Width

X: pp . hhh aa
 Pen Bar Alternate
 Width Height Space Width
 (Non HP-41
 Bar Code
 Only)

Using zeros in place of any parameter element sets that element to its default value. Default values are:

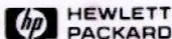
| <i>pp</i> . <i>hhh</i> <i>aa</i> | <i>nn</i> . <i>t</i> <i>ww</i> <i>ss</i> |
|----------------------------------|--|
| 12 . 350 00 | 18 . 0 30 21 |

BCX

Places in ALPHA register a bit pattern for non-sequenced bar code representing data in X-register. Places value in X-register to indicate number of bytes in bit pattern.

BCXS

Places in ALPHA register a bit pattern for sequenced bar code representing data in X-register and sequence number in Y-register. Places value in X-register to indicate number of bytes in bit pattern.



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